CLAIMS

What is claimed is:

1. An apparatus comprising:

a mask protective device including a transparent portion that is transparent to a photolithography radiation;

a patterned mask including a pattern defined at least in part by an opaque portion that is opaque to the particular photolithography radiation;

a wall to connect the mask protective device with the patterned mask, the mask protective device, the patterned mask, and the wall defining a gas-filled enclosure; and

a vent to add a first gas to the enclosure and to remove a second gas from the enclosure, the first gas having a substantially different composition than the second gas.

2. The apparatus of claim 1, wherein the mask protective device is attached to the patterned mask with an adhesive.

3. The apparatus of claim 1, further comprising a gas source having a higher concentration of the first gas than the enclosure and a lower concentration of the second gas than the enclosure and connected with the vent to add the first quantity of the first gas to the enclosure through the vent.

4. The apparatus of claim 1, wherein the vent includes a first enclosure opening defined by the wall and a second enclosure opening defined by the wall.

5. The apparatus of claim 4, wherein the wall has a first side and a second side opposite the first side, and wherein the first enclosure opening is in the first side and the second enclosure opening is in the second side.

6. The apparatus of claim 1, further comprising a radiation source to generate radiation with a different wavelength than the photolithography radiation to transmit radiation through the enclosure to increase the rate of diffusion of the gas in the enclosure.

7. The apparatus of claim 1, further comprising a rotary vacuum generator, the rotary vacuum generator including a rotor and a compression chamber to reduce the total pressure inside the enclosure to below 500 millimeters of mercury.

8. The apparatus of claim 1, wherein the first gas that has a higher transmissivity for the photolithography radiation than the second gas.

9. The apparatus of claim 1, wherein the vent has a surface area on the wall that is at least five percent of a total surface area of the wall.

10. The apparatus of claim 1, wherein the vent comprises:

an inlet opening defined by the wall to add a first gas to the enclosure; and

an outlet opening defined by the wall to remove a second gas from the enclosure.

11. The apparatus of claim 10, further comprising:

a gas source having the first gas at a pressure that is higher than the pressure of the enclosure and connected with the inlet opening to add the first gas to the enclosure through the inlet opening; and

a gas destination having a volume at a pressure that is lower than the pressure of the first gas at the gas source and connected with the outlet opening to remove the second gas from the enclosure through the outlet opening.

12. The apparatus of claim 10, wherein the wall has a first side and a second side opposite the first side, and wherein the inlet opening is in the first side of the wall and the outlet opening is in the second side of the wall.

13. The apparatus of claim 10, wherein the inlet opening includes a plurality of discrete ports.

14. The apparatus of claim 10, wherein the first gas absorbs less of the photolithography radiation than the second gas.

15. An apparatus comprising:

a mask protective device including a transparent portion that is transparent to a particular photolithography radiation;

a patterned mask including a pattern defined at least in part by an opaque portion that is opaque to the particular photolithography radiation;

a wall to connect the mask protective device with the patterned mask, wherein the mask protective device, the patterned mask, and the wall define an enclosure; and

a gas filling the enclosure, the gas having a transmissivity of the photolithography radiation greater than that of the surrounding ambient air.

16. The apparatus of claim 15, wherein the mask protective device is attached to the patterned mask with an adhesive.

17. The apparatus of claim 15, wherein the gas filling the enclosure includes less than 10% molecular oxygen by volume.

18. A method comprising:

adding a first gas to an enclosure filled with a second gas through a vent, the first gas having a different composition than the second gas, and the enclosure being between a mask protective device having a portion that is transparent to a photolithography radiation, a patterned mask having a portion that is opaque to the photolithography radiation, and a wall connecting the mask protective device with the patterned mask; and

removing the second gas from the enclosure through the vent.

19. The method of claim 18, wherein adding the first gas comprises adding the first gas through an inlet opening of the vent, and wherein removing the second gas comprises removing the second gas through an outlet opening of the vent.

20. The method of claim 19, wherein adding comprises driving the first gas into the enclosure through the inlet opening by pressure, and wherein removing comprises simultaneously driving the second gas from the enclosure through the outlet opening by pressure.

21. The method of claim 18, wherein adding a first gas comprises adding a molar quantity of gas substantially similar to the molar quantity of the second gas in the enclosure before adding begins.

22. The method of claim 18, wherein adding comprises adding a first gas that has a higher transmissivity for the photolithography radiation than the second gas.

23. The method of claim 18, wherein:

adding the first gas comprises providing a higher concentration of the first gas on an outside of the enclosure than on an inside of the enclosure proximate the vent and adding the first gas to the enclosure by diffusion; and

removing the second gas comprises providing a lower concentration of the second gas on an outside of the enclosure than on an inside of the enclosure proximate the vent and removing the second gas from the enclosure by diffusion.

24. The method of claim 23, wherein adding the first gas comprises adding the first gas through at least two openings of the vent, and wherein removing includes removing the second quantity of the second gas through the at least two openings.

25. The method of claim 18, further comprising transmitting radiation having a different wavelength than a wavelength of the photolithography radiation through the enclosure to increase the diffusion coefficient of a molecule in the enclosure.

26. The method of claim 18, further comprising reducing the total pressure inside the enclosure to below 500 millimeters of mercury.

27. The method of claim 18, wherein adding comprises adding a first gas that has a higher transmissivity for the photolithography radiation than the second gas.

28. A method comprising:

attaching a mask protective device having a portion that is transparent to a photolithography radiation to a wall, the wall being attached to a patterned mask having a portion that is opaque to the photolithography radiation, the attaching enclosing a volume of a second gas between the mask protective device and the patterned mask;

adding the first gas to the enclosed volume of the second gas, the first gas having a different composition than the second gas; and

removing the second gas from the enclosed volume.

29. The method of claim 28, further comprising transmitting the photolithography radiation through the mask protective device for a predetermined period of time.

30. The method of claim 28, wherein attaching comprises attaching with an adhesive.